



## **The Sustainable Value of Culinary Medicine and Teaching Kitchen Programs: Expanding the South Health Campus Wellness Kitchen Operational Model to a Satellite Teaching Kitchen to Support Cancer Patient's Access to Care within AHS**

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### **Background**

Estimates from the 2022 Alberta Health Services (AHS) Future of Cancer impact report indicate “one in two Albertans will be diagnosed with cancer in their lifetime and at least one in five will die of the disease” (Alberta Health Services, 2022). Even in nonfatal cases, a cancer diagnosis frequently represents initiation of long-term medical treatments and specialised care, which can be required for months and even years, and cancer survivorship is accompanied by monitoring and healthcare support. To address the costly impact of cancer to not only the physical, mental, and emotional health of individual Albertans, but also to our health system, communities, economy, and planetary health, those leading the field identify that it is critical Alberta's cancer system be equipped for the future. “Understanding the needs of patients throughout diagnosis, treatment and care is important to ensure optimal outcomes and experiences, while effectively managing and allocating resources.” In Alberta, oncology patients specifically request additional support with nutrition intervention and dietary management approaches (Alberta Health Services, 2022).

Diet is considered a modifiable behavioural risk factor for noncommunicable diseases, including cancer, which combined are responsible for 74% of all deaths globally (World Health Organization (WHO), 2023). The WHO identifies reducing dietary risk factors as an important opportunity to control noncommunicable diseases, highlighting that low-cost interventions to modifiable risk factors “are excellent economic, [health, and planetary] investments because, if provided early to patients, they can reduce the need for more expensive treatment” (WHO, 2023). Among those living with cancer, nutrition status is considered a predictive factor of prognosis: malnutrition and related severe weight loss, sarcopenia, anorexia, and cachexia coalesce into severe consequences including, “increased incidence and severity of treatment side effects and increased risk of infection, thereby reducing chances for survival” (National Cancer Institute, 2024). However, nutrition intervention achieves improved nutrition status, quality of life, ability to tolerate and complete treatment regimes, and better surgical outcomes, leading to better mortality rates and less morbidity, and requiring less intervention overall.

Increasingly, patients and providers seek dietary interventions that equip individuals and their support networks “to access and prepare affordable and nutritious foods in combination with evidence-based [and condition specific nutrition] guidance” (Eisenberg et al., 2023). Known as Culinary Medicine (CM) interventions, these programs use skill building and experiential learning to develop participants' and caregivers' confidence and self-efficacy in applying evidence-based nutrition care recommendations. Delivered in virtual or in-person formats, these programs can be offered from simple pop-ups in meeting rooms to built-in teaching kitchens (TK) (Eisenberg et al., 2023). CM can provide cancer care



patients with practical experience and skills for incorporating changes to their diets that will best support them as they move through cancer treatment and to survivorship.

While the application of CM in oncology is emerging, protocols and trials are confirming the feasibility, acceptability, and potential for nutrition and health outcomes of this approach. Winters and colleagues piloted the “Eat to Live” CM program among patients receiving radiotherapy for head and neck cancers, and found improvements in food selection and food skills confidence (Allen-Winters et al., 2019). In a larger, 10-week, wait-list control, multidisciplinary CM intervention trial for 184 cancer patients and survivors (culinary intervention: n = 96; wait-list control: n = 88) Barak-Nahum and colleagues found improvements to both emotional and physical measures, reporting increased quality of life, positive affect, and healthy food choices, with reduced negative affect in the intervention group (Barak-Nahum, 2016). Huang and colleagues found improvements to mindfulness scores among breast cancer survivors through a 9-week, multidisciplinary, virtual culinary medicine intervention called Survivors Overcoming and Achieving Resiliency (SOAR) (Huang et al., 2023). And, in their Building Recipes and Understanding Nutrition for Cancer-survivor Health (BRUNCH) study, Urowitz and colleagues found colorectal cancer survivors intended to use the demonstrated recipes or consume example ingredient combinations more often following the program, thought the program would be helpful to changing their eating habits, and were likely to make recipes prepared in “home use testing” during the study again (Urowitz et al., 2012). Advances in virtual delivery of these programs align with other findings of sustainability, in the form of carbon-emission savings, from telemedicine care for patients with cancer (Patel et al., 2023; McGuire et al., 2023).

The American Society of Clinical Oncology 2023 policy statement on Climate Change and Cancer Care presents numerous examples where current approaches to oncology care impacts climate change, including in the areas of: surgical intervention, radiation therapy, medications (including oral and infused chemotherapies), hospital stays, physician’s services, and travel for rural patients with cancer to access care (Bernicker et al., 2023). Embracing a triple bottom line sustainable value conception of the oncology provider’s roles in climate change, they call for a focus on the social determinants of health and equitable, optimised, cancer care and incidence reduction through practical change. While more research is needed to evaluate the benefits to sustainability of delivering nutrition interventions in oncology using CM, there exists compelling potential for this approach to improve clinical outcomes (including healthcare equity), alongside social, environmental, and financial aspects of sustainability.

### **The South Health Campus (SHC) Wellness Kitchen**

The SHC Wellness Kitchen, the first and only TK in operation in AHS, opened in May 2013. The Wellness Kitchen’s resource efficient team of four staff operates in a collaborative partnership model with key AHS departments, local community organisations and national and international networks to advance CM in Alberta to improve the health of patients and families (see Appendix 1 for a list of partners and networks and Wellness Kitchen core business details). The Wellness Kitchen team develops, implements, and evaluates innovative CM interventions with clinical teams, leveraging pragmatic research trials through implementation science approaches, healthcare quality improvement principles, and emphasises community, patient, and family centred collaborative care. Specific to oncology care, the Wellness Kitchen partners with oncology registered dietitians (RDs) and a cancer community not-for-profit partner to provide a unique in-person program for patients living with



cancer and their caregivers called “*Cancer Recovery for People with Eating Challenges*.” The goal of this program is to address common changes and barriers to good nutrition, adequate intake, and healthy food consumption during cancer treatment and diagnosis.

The SHC Wellness Kitchen offers the following programs for specific patient populations:

- *Cancer Recovery for People with Eating Challenges* (RD facilitated; in-person)
- *Preparing for Bariatric Surgery Cooking Class* (RD facilitated; virtual; focused on appropriate meals immediately post-surgery)
- *Own Your Bones* (Interdisciplinary—RD, physiotherapist, family medicine physician co-facilitated; in-person; multicomponent 4-week practical shared medical appointment for bone health and osteoporosis management)

And has a number of programs available to the public:

- *Cooking When Fatigued* (Interdisciplinary—RD and occupational therapist co-facilitated; in-person and virtual; focused on those with chronic fatigue or mobility issues related to neurological conditions or arthritis)
- *Tasty, Low Salt Cooking - Meal Ideas* (RD facilitated; in-person and virtual; focused on dietary sodium reduction)
- *Tasty, Low Salt Cooking - Dips & Sauces* (RD facilitated; in-person and virtual; focused on dietary sodium reduction)
- *Easy & Healthy Mediterranean* (RD facilitated; in-person and virtual; focused on Mediterranean style dietary patterns)
- *The 4 P's for Meal Planning: Cooking Edition* (RD facilitated; in-person; focused on translating nutrition knowledge into practice)

### **Opportunities:**

In the 2016 Cancer Care Alberta - Supportive Care Framework Report, the Patient Engagement Survey identified that clinical nutrition was the service used the most by patients. National and international key informant interviews identified the importance of “cater[ing] to various learning styles” and specifically gave CM examples to do so: “[p]rovide cooking demonstrations to show patients how to prepare foods that are easy to swallow” (AHS, 2016).

Findings from the current SHC Wellness Kitchen *Cancer Recovery for People with Eating Challenges* program surveys indicate the relevance of this program for this patient population. 100% of oncology patients and their caregivers in attendance strongly agree the program helps them feel less isolated in their cancer journey; 88% strongly agree and 13% agree that the program helped improve their mental health and wellbeing; 50% strongly agree and 13% agree their level of distress is reduced as a result of the program; and 100% would ‘definitely’ recommend the program if a friend were in need of a similar service (Wellspring Calgary 2024). In addition to the quantitative results, patients and their caregivers provided the following qualitative responses (Wellspring Calgary 2016-2018):

*Q: What were the most important learnings for you from this program?*

[Participant 1]: “We are not alone in our battle. Everyone has issues.”

[Participant 2]: “Engagement with others on a cancer journey.”

[Participant 3]: “Listening to others' food suggestions. You always learn something new.”



*Q: Has this program influenced any change in your life?*

[Participant 4]: “Yes, definitely all the information was a game changer for me.”

While the findings from this program are overwhelmingly positive, offering the program at SHC, at a distance from other oncology clinics and services, results in significant unawareness and underutilisation of the service. While community partnership is a strong asset to this program, the current registration processes depend on this partner’s engagement, and, at an arm’s length from clinical care, results in fewer patients accessing the program, and barriers to clinical integration (including data collection, referral, and measurement). However, while the SHC Wellness Kitchen is as yet the only operational TK in AHS, the advantages of CM and the opportunities to capitalise on co-location of CM services alongside specialty services has resulted in TKs being included in designs, plans, and builds of new specialty AHS facilities. Where TKs are already included in the plans for integrated specialty care facilities, they should be optimised and utilised to their full potential. As CM is an emerging approach to care, operational models for specialty care integration depend on a relatively scarce skill set, experience, and expertise. The SHC Wellness Kitchen team is well placed to support others seeking to integrate CM and TKs into patient care services. The expertise of leaders at SHC provide opportunities for operational improvement and efficiency ensuring minimal delays in establishing high quality CM patient programming, as well as establishing community and research partnerships. Similar to any specialised clinical facility or service, the TK is a clinical intervention space that requires organisation, maintenance and multidisciplinary staff support to meet operational and practice standards, as well as program support to enable healthcare providers such as RDs and other clinicians to deliver unique patient care intervention from the space. Research, philanthropic funding organisations, and clinical and support service partnerships must be developed, fostered, and managed to optimise the potential of this resource for innovative nutrition care for oncology patients and clinical advances in nutrition care and management for oncology.

### **Project Aims:**

Leveraging the operational efficiencies, skill set, experience, and expertise of the SHC Wellness Kitchen and its team, a satellite model of operations is proposed to launch and establish a CM strategy in cancer care. We anticipate this model will foster improved clinical integration, tailored programming, timely patient access to oncology specific CM cancer care, and improve experiences and outcomes for cancer care patients and their caregivers. This proposed model aligns with the Centre for Sustainable Healthcare principles of sustainable practice, offering opportunities for prevention, patient empowerment and self-care, lean clinical pathways, and low carbon alternatives. Using CM intervention as an approach to improve the nutrition status of oncology patients throughout cancer treatment and recovery has the potential to improve the frequency and intensity of other oncology interventions needed to optimise care, including surgical interventions, radiation therapy, medications (including oral and infused chemotherapies), hospital stays, physician’s services, and travel for rural patients with cancer to access care. Although theoretical, this model has the opportunity to not only meet patient needs and preference regarding nutrition services and oncology care, but ultimately to improve all parameters of the triple bottom line (environmental, social, and financial impacts) of sustainability in cancer care in Alberta.



## Potential impacts

### *Clinical Impacts*

While standard nutrition care interventions primarily target improved food and nutrition knowledge; knowledge alone is often insufficient to achieve dietary recommendations and maintain or improve nutrition status, particularly in the management of cancer and its symptoms where comorbid fatigue, taste, texture, appetite, and GI disturbances present common barriers to optimised intake and often result in malnutrition (Cancer Care Alberta 2024). Opportunities to practise applications of nutrition knowledge in experiential CM programs supports patients and their caregivers to develop the skills, self-efficacy, confidence, and capacity needed to prepare and consume nutritionally appropriate meals and snacks throughout the course of cancer diagnosis and management. Clinician-led, recipe-based, contextualization of oncology nutrition recommendations helps patients and their caregivers to optimise intake despite varying symptoms and energy levels, thereby improving nutrition status throughout the course of cancer diagnosis and management. Improved nutrition status promotes healing, decelerates catabolism, increases tolerance of oncology treatments and their side effects, improves surgical outcomes (including intra and post-operative complications, length of stay post op, and acuity of intervention needed during surgery), and mitigates both oncology morbidity and mortality (Cook et al., 2022; Altman et al., 2019; Chiewhatpong et al., 2022). Considered in terms of implementation science, integrating oncology CM interventions within comprehensive cancer care is a form of integrated knowledge translation. Integrated knowledge translation is associated with numerous clinical benefits, including increased clinician awareness and adoption of, and referral to this resource; enhanced opportunities to embed these programs into the interdisciplinary clinical care pathway; increased outcome tracking, pragmatic clinical trials, and quality improvement opportunities; and increased patient and caregiver access to, acceptability of, and buy-in for programs.

### *Environmental Impact*

Considered from the lens of the overall burden of healthcare (an estimated 4-6% of all global emissions) and calculations based on acuity that show *the ICU generates 7.1 kg of solid waste and 138 kg CO<sub>2</sub>e per bed day, whereas an acute care unit generates only 5.5 kg of solid waste and 45 kgCO<sub>2</sub>e per hospitalisation day* (Prasad et al. 2021), the primary and secondary prevention capacity of CM interventions are an untapped approach for sustainable, effective, and fiscally prudent, healthcare intervention. In oncology care specifically, the highest potential for environmental savings come in the form of reduced surgical intervention, radiation therapy, medications (including oral and infused chemotherapies), hospital stays, and physician's services. While studies and life cycle assessments of carbon emission reduction still need to be conducted in this area, it follows that where nutrition status of cancer patients is improved through CM, and therefore symptoms of cancer and its treatments, and the need for more intensive treatment, is reduced, so too the environmental burden of cancer care will be decreased.

Focusing on surgical intervention and hospital stays, improved nutrition status reduces the risk of surgical complications, post-surgery hospital length of stays, and acuity of those stays (Altman et al., 2019). Therefore, CM for an oncology population who frequently requires surgery, for example those with head and neck cancers, has potential to significantly reduce carbon emissions from the care of these patients.



Considering medication as one theoretical calculation example, >90% adult patients receiving potentially emetogenic chemotherapy like cisplatin experience emesis. Management regimes recommend a quadruple combination of medication (including Olanzapine) to manage nausea and vomiting symptoms, both on the day of chemotherapy treatment and on subsequent days (Cancer Care Alberta, 2024). If CM intervention improved nutrition-related management of nausea and vomiting symptoms, such that even one dose of Olanzapine could be reduced for patients over the entire chemotherapy treatment course, it would represent significant carbon emissions savings. Below is an illustrative example.

**Carbon footprint calculation example - impact of reducing Olanzapine use:**

Using a 'top down' approach for calculating CO2 equivalents (CO2e).

Olanzapine

**List price per 2.5 mg tablet = \$18.79CAD\***

(\*List price does not reflect the sale price of contracted price for AHS).

Carbon conversion factor for pharmaceutical products/drugs (adapted from 2020 DEFRA UK for CAD currency as per the AHS Office of Sustainability)

**0.72216 kgCO2e/CAD**

**\$18.79/2.5mg tab Olanzapine x 0.72216 kgCO2e/CAD = 13.5693864 kgCO2e/tab**

Extrapolate to 1000 patients reducing use of 1 tab Olanzapine over the course of treatment:

**1000 patients x 13.5693864 kgCO2e/tab = 13,569.3864 kgCO2e**

Projected CO2e equivalent to KM driven in a car

(average Canadian passenger vehicle [Fuel consumption ratings search tool \(nrcan-rncan.gc.ca\)](https://www.nrcan-rncan.gc.ca/fuel-consumption-ratings-search-tool)).

**Emission factor = 0.259 kgCO2e/km**

**0.259 kgCO2e/km x 13,569.3864 kgCO2e = 3,514.47 km** (approximate distance from Calgary AB to Fredericton NB)

A CM intervention focused on dietary management of nausea and vomiting could theoretically result in a reduction of 1 tab of Olanzapine over an entire course of cancer treatment. Extrapolated to 1000 patients results in a reduction of 13,569 kgCO2e which is the equivalent to driving a car from Calgary to Fredericton, NB. This example illustrates how CM can theoretically reduce utilisation of the healthcare system in other ways for even more pronounced positive impacts on the environment.

Leveraging broadcast media technology built-in to the TKs to provide virtual service to patients and families throughout the province (as opposed to a model for cancer care treatment that would require multiple TKs to be built) also enables more equitable service delivery across the province reaching rural and remote areas and provides an additional patient-centred way to reduce barriers to program attendance such as mobility issues, transportation, childcare or illness. Virtual attendance of CM



programs further reduces the carbon footprint of CM classes by reducing the amount of travel required for patients to attend.

### *Financial*

CM in TKs as an effective therapeutic treatment strategy for patients offers the potential for significant long term financial savings related to optimal use of TK space (building a TK requires a large initial financial investment), and reduced utilisation of healthcare services described above (reduced use of medications, decreased length of stay in acute care etc.) Using the same example above, if one dose of Olanzapine 2.5mg tablet (list price 18.79CAD) could be reduced per patient for 1000 patients over the course of their treatment, costs of \$18,790 CAD would be avoided.

**Financial impact calculation example** - impact of reducing Olanzapine use:

Olanzapine

**List price per 2.5 mg tablet = \$18.79CAD\***

(\*List price does not reflect the sale price of contracted price for AHS).

Extrapolate to 1000 patients reducing use of 1 tab Olanzapine over the course of treatment:

**1000 patients x \$18.79CAD = \$ 18,790.00CAD**

Cost savings and avoidances can also be realised through time and labour cost efficiencies achieved through scaling operations of an existing successful TK to a satellite, utilising existing expertise in a new area of service to limit time required to operationalize a satellite, and virtual technology reducing the need for program facilitator travel saving time, fuel and parking costs.

Optimising spaces such as TKs and utilising them as intended also offers savings related to effective resource use once the initial financial expenditures have been made.

### *Social*

CM programs in TKs also offer opportunities to improve the patient and family experience as well as provider experience.

Improved patient, caregiver, and family experience

- Virtual CM programs can increase ability to participate in programs by reducing barriers to attending such as fatigue, illness, transportation & parking ability and costs, childcare, and mobility.
- Virtual CM programs provide opportunity for more equitable healthcare to a wider number of Albertans with adequate technology and internet connection whether a few short km away or hundreds of km away in rural and remote areas of Alberta.
- Both in-person and virtual CM programs decrease feelings of isolation, and foster social connection of those experiencing similar diagnoses and treatments.
- Better management of symptoms can have mental health benefits if patients and families feel more confident in engaging with others socially.



- CM programs can improve patient and family satisfaction through the ability to address more specific nutrition needs.
- CM provides caregivers and families a sense of control over caring for their loved one.

#### Class feedback (Wellspring 2016-2018)

- “Being a caregiver, I am excited to see how easy it is to prepare a meal and enjoy with my spouse”
- “This was excellent, thank you. I am supporting my friend with cancer and have found these classes really informative. Great energy levels - it’s contagious.”

#### Improved provider experience

- CM programs integrated into care pathways within the electronic medical record (EMR) saves time and improves the ability of providers to refer patients to programs and document interventions in patient EMRs.
- CM programs offer opportunities for targeted clinical research with research teams.
- Clinical teams who have a desire to utilise this resource and deliver and expand on CM care for oncology patients can do this while expanding interdisciplinary activity, research, and building best practices in an emerging clinical area for CM.
- Clinical teams ancillary to the intervention will have the opportunity to learn about CM and refer patients and families to programs.

#### Outcome measures for potential impacts

Comprehensive measurements are needed to assess the full impact of CM on the parameters of the triple bottom line of sustainability (environmental, social, and financial impacts). These can be built on the basic program and satisfaction evaluation currently done with the current cancer focused CM program, but require a more robust evaluation framework and specific research protocols done in collaboration with key partners and stakeholders.

#### Potential CM Evaluation Measurements:

- attendance (# patients registered; # patients attended)
- program (# program sessions offered)
- pre/post nutrition knowledge
- pre/post culinary skills
- patient experience/satisfaction
- provider experience/satisfaction
- clinical staff awareness and knowledge of TKs and CM programs available

#### Potential CM Research Measurements

- Malnutrition status
- Tolerance of oncology treatments and their side effects
- Surgical outcomes (including intra and post-operative complications)
- Length of hospital stay post-op
- Acuity of interventions needed





## Discussion

What is described above is a theoretical proposal, and while founded on solid principles of nutrition care in oncology and emerging evidence for CM broadly as well as in cancer care, the model must be tested in a clinical setting before any of the claimed benefits, and any unforeseen risks can be clearly determined.

The proposed CM model can be applied not only in a cancer setting, but more broadly to many other diet-influenced illnesses. Difficulties inherent to nutrition and lifestyle behaviour related research such as the often lengthy timelines required to show outcomes and the in-depth research protocols needed to establish effectiveness of an intervention can be significant barriers to establishing buy-in from decision-makers and funders. Support of these upstream types of interventions, however, in addition to more acute downstream interventions are needed for a sustainable healthcare system.

## Conclusion

Leveraging the operational efficiencies, skill set, experience, and expertise of the SHC Wellness Kitchen and its team, a satellite model of operations to establish a CM strategy in cancer care has significant potential to improve clinical integration, timely patient access to oncology specific CM cancer care, and improve experiences and outcomes for cancer care patients and their caregivers. The satellite model aligns with the Centre for Sustainable Healthcare principles of sustainable practice, offering opportunities for prevention, patient empowerment and self-care, lean clinical pathways, and low carbon alternatives to improve all parameters of the triple bottom line (environmental, social, and financial impacts) of sustainability in cancer care in Alberta.

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## Appendices

### Appendix 1

Key Wellness Kitchen partners:

- Calgary Zone and Provincial Nutrition Services Registered Dietitians (RD)
- Allied Health Occupational Therapists (OT)
- Alberta Healthy Living Program RDs, physiotherapists (PT) and kinesiologists
- Digital Media Services
- Telehealth
- Community organisations: Wellspring Alberta - Calgary
- Universities of Calgary and Alberta

Key Wellness Kitchen memberships:

- Teaching Kitchen Collaborative - first Canadian teaching kitchen facility to hold an invited membership with this global organisation.

[Teaching Kitchen Collaborative – The Teaching Kitchen Collaborative \(TKC\) is an invitational network of thought leading organizations using teaching kitchen facilities as catalysts of enhanced personal and public health across medical, corporate, school, and community settings. \(teachingkitchens.org\)](http://teachingkitchens.org)

SHC Wellness Kitchen core business activities:

- Support day to day operations of a hospital-based patient teaching, delivering clinically-focused virtual and in-person CM patient programs in collaboration with healthcare providers who contribute clinical expertise and class instruction.
  - Program support includes collaborating with key partners on curriculum development, evaluation, and media technology for virtual programming, and management of kitchen operations, program promotion, registration, patient materials, and TK mise en place and class setup.
  - While broadcast from SHC, reach of virtual programs extends province-wide
- Develop, pilot, evaluate, and recommend CM best practices.
- Collaborate with internal AHS teams, including Digital Media Services and Nutrition Services, to develop and produce patient and family-focused recorded CM videos.
- Collaborate with researchers at the University of Calgary and the University of Alberta to perform CM research.
- Develop, deliver, and evaluate CM education for healthcare providers and trainees in collaboration with universities in Alberta and nationally.

